epidemic detection, resource planning, and deployment planning within a hospital or hospital system.

**[0700]** FIG. **149** shows a block diagram **14900** of a beside portion of the electronic patient system of FIG. **147** and/or FIG. **148** in accordance with an embodiment of the present disclosure. The diagram **14900** includes a monitoring client **14902** (which may be the tablet **148120**), a monitoring-client adapter **14904** such that the monitoring client **14902** can interface with the dock/hub **14906** (which may be the dock/hub **14812**), and several infusion pumps **14910**. The dock/hub **14906** may communicate with the infusion pumps **14910** via WiFi, Zigbee, Bluetooth, a mesh network, a point-to-point protocol (e.g., based upon WiFi), etc. The infusion pumps **14910** may be power directly via the AC outlet **14908** (not depicted) and/or from the dock/hub **14906** directly. The dock/hub **14906** is coupled to the wireless sensors **14814** (wirelessly or wired) and to USB sensors **14912** via a USB cable.

**[0701]** In some embodiments of the present disclosure, another in-room display may be present, e.g., a hub, monitoring client, computer, etc. that can communicate with the dock/hub **14812** and/or tablet **14810** via WiFi, Ethernet, Bluetooth, USB, or other protocol via a dedicated or non-dedicated communications link.

**[0702]** FIG. **150** shows a block diagram of the dock/hub **15000** of FIGS. **147**, **148**, and/or **149** in accordance with an embodiment of the present disclosure. The dock/hub **15000** includes a primary processor **15003** and a safety processor **15002** (which one or both may be a processor, a microprocessor, or a microcontroller, for example a Snapdragon processor).

**[0703]** The safety processor **15002** is coupled to a speaker driver **15011** which controls a backup speaker **15012**. The safety processor **15002** is also coupled to a 2× CAN bus connected to a patient-care device via the device connector **15014**. In some embodiments, the device connector **15014** communicates with a patient-care device via a Zigbee, Bluetooth, WiFi, CAN Bus, or SPI communications link.

**[0704]** The safety processor **15002** is coupled to a voltage regulator **15010** which receives power from a backup battery **15017** and/or from a battery charger **15009**. The safety processor **15002** is coupled to an enable switch **15016** that can disable the power supply to a patient-care device coupled to the device connector **15014**. The current limiter **15015** can also limit the current to a patient-care device coupled to the device connector **15014**.

**[0705]** The safety processor **15002** is also coupled to an enable **15020** switch which enables/disables a 5 volt power supply to the patient-care device coupled via the device connector **15014**. The 5V signal to the patient-care device is received from the voltage regulator **15010** which receives its power from a primary battery cell **15018** and/or the battery charger **15009**. The battery charger receives power via an AC/DC converter **15008** coupled to an AC outlet **15007**.

**[0706]** The primary processor **15003** is coupled to a camera **15024**, a WiFi transceiver **15025**, a Bluetooth **15026** transceiver, an RFID interrogator **15027**, LED status lights **15029**, buttons **15028**, and a near-field communications transceiver **15030**.

**[0707]** The primary processor **15003** is coupled to a USB cable that couples to a USB port **15023** and/or a monitoring client via a UI connector **15022**. In some embodiments, the primary processor **15003** can communicate with a tablet via a WiFi or other wireless communications link. The primary processor **15003** can communicate with a patient-care device via the USB connection **15023** and/or the monitoring client via a USB port via the UI connector **15022**. The primary processor **15003** communicates a signal to a speaker driver **15006** which drives a primary speaker **150005**.

**[0708]** FIG. **151** is a block diagram illustrating the infusion pump circuitry **15100** of FIGS. **148** and/or **149** in accordance with an embodiment of the present disclosure. The circuitry **151** includes a UI/safety processor **15102** that controls the pump display **15104** and logs data in non-volatile memory **15105**. The UI/safety processor **15102** communicates with a hub/dock via a CAN bus coupled to the device connector **15108**. In some embodiments the real-time processor **151102** and/or UI/safety processor **15102** communicates with a hub/dock via the device connector **15108** using a Bluetooth, a wireless, or a wired communications link. The UI/Safety processor **15102** may include an image processing library to processes imagery from a camera. Additionally or alternatively, the UI/Safety processor **15102** may include a library to display a GUI interface on the pump display **15104** (which may be a touchscreen).

**[0709]** The UI/safety processor **15102** is coupled to an occlude-in-place sensor **1516**, a latch sensor **15117**, an air-in-line sensor **1518**, a motor hall sensors **15119**, buttons **15120**, and status lights **15112**. The safety processor **15102** provides watchdog functionality to the real-time processor **15103** (which may be a processor, a microprocessor, or a microcontroller, for example a SnapDragon processor) and can enable the motor drive **15107**.

**[0710]** The real-time processor **15103** (which one or both may be a processor, a microprocessor, or a microcontroller, for example a SnapDragon processor) controls the operation of the pump's motor **15106** via the motor drive **15107**. The real-time processor **15103** communicates with the UI/Safety processor **15102** (e.g., to receive pump settings) via a serial interface. The real-time processor **15103** loads pump calibration data from a non-volatile memory **15122**. The non-volatile memory **15122** and/or the non-volatile memory **15105** may be an SD card and/or an RFID tag.

**[0711]** The real-time processor **15103** receives data about the infusion pump from the motor current sensor **15109**, the motor housing temperature **15110**, the occlusion pressure sensor **15111**, the cam shaft position sensor **15112**, the cam follower position sensors **1513**, and/or accelerometer **15114**.

**[0712]** In FIGS. **151** and **152**, the two processors may be used to confirm instruction(s), to perform safety checks, or other functionality (e.g., user confirmation of a patient-treatment parameter) in an identical and/or similar manner as disclosed in U.S. patent application Ser. No. 12/249,600, filed Oct. 10, 2008 and entitled Multi-Language/Multi-Processor Infusion Pump Assembly, now U.S. Publication No. US-2010-0094221, published Apr. 15, 2010 (Attorney Docket No. F54), which is hereby incorporated by reference.

**[0713]** FIG. **152** is a block diagram **1500** illustrating the sensors coupled to the mechanics of an infusion pump for use with the infusion pump circuitry of FIG. **151** in accordance with an embodiment of the present disclosure. The infusion pumps fluid via a tube **15207**. The motor **15204** includes motor hall-effect sensors **15205**, a motor housing temperature sensor **15206**, hall-effect sensors **15201** and **15202** to detect the movement of the slide-clamp mechanism **15220**, a hall-effect sensor **15211** for an outlet valve, hall-